



- 1 Ravi flips a coin 50 times. It lands on heads 28 times.
Work out the relative frequency of heads. Give your answer as a decimal.

(2 marks)

relative frequency = successes ÷ trials

$$\frac{28}{50} = 0.56$$

0.56

- 2 A spinner has four colours. This table shows the relative frequency of each colour from an experiment.

Colour	Red	Blue	Green	Yellow
Relative frequency	0.3	0.25	x	0.15

- a. Work out the value of x .
b. The spinner is spun 80 more times. Estimate how many times it lands on blue.

(3 marks)

a)

$$0.3 + 0.25 + 0.15 = 0.7$$

$$x = 1 - 0.7 = 0.3$$

b)

$$0.25 \times 80 = 20$$

a) 0.3 b) 20

3

Amy and Ben each spin the same spinner and record how many times it lands on red.

	Number of spins	Number of reds
Amy	50	18
Ben	150	42

Using all of the results, work out the best estimate for the probability that the spinner lands on red.

(2 marks)

Combining both sets of results gives the largest number of trials, so it gives the best estimate

$$\text{Total reds} = 18 + 42 = 60, \text{ total spins} = 50 + 150 = 200$$

$$\text{Best estimate for } P(\text{red}) = \frac{60}{200} = \frac{3}{10} = 0.3$$

$$\frac{3}{10}$$

4

Chloe takes a counter from a bag, records its colour and puts it back. She does this 80 times.

Colour	Red	Yellow	Blue
Frequency	20	36	24

a. Write down the best estimate of the probability that the next counter is yellow.

b. There are 40 counters in the bag. Estimate how many are yellow.

(3 marks)

a)

$$\frac{36}{80} = \frac{9}{20}$$

b)

$$\frac{9}{20} \times 40 = 18$$

$$\text{a) } \frac{9}{20} \quad \text{b) } 18$$

5

A three-colour spinner can land on red, white or blue.

The spinner is spun 100 times. The table shows the results.

Colour	red	white	blue
Frequency	25	35	40

- Work out the best estimate for the probability that the spinner lands on blue.
- Two of these identical spinners are spun together. Use the results to estimate the probability that both spinners land on red.

Assume the two spinners operate independently.

(5 marks)

$$\text{Estimate for } P(\text{blue}) = \frac{40}{100} = \frac{2}{5}$$

$$\text{Estimate for } P(\text{red}) = \frac{25}{100} = \frac{1}{4}$$

$$\text{The spinners are independent, so } P(\text{both red}) = \frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$$

6

A spinner has three colours. It is spun 50 times.

Colour	Red	Blue	Green
Frequency	18	12	20

- Work out the relative frequency of green.
- Estimate how many times the spinner lands on green in 200 spins.

(3 marks)

a)

$$\frac{20}{50} = 0.4$$

b)

$$0.4 \times 200 = 80$$

a) 0.4 b) 80

7

Tom rolls a dice several times and records the number of sixes.

Number of rolls	10	50	100	500
Number of sixes	3	11	20	85
Relative frequency	0.3		0.2	

- Complete the table.
- Which of the four results gives the most reliable estimate of the probability of rolling a six? Give a reason.
- Is the dice fair? Use the table to explain your answer.

(4 marks)

a)

$$11 \div 50 = 0.22$$

$$85 \div 500 = 0.17$$

b)

500 rolls: the most trials

c)

$$\frac{1}{6} = 0.167$$

0.17 is very close

a) 0.22, 0.17 c) probably fair

8

Layla drops a drawing pin 20 times and it lands point up 13 times. Ben drops the same drawing pin 200 times and it lands point up 96 times.

- Whose results give the better estimate of the probability of landing point up? Give a reason.
- Use the better estimate to predict how many times the pin lands point up in 1000 drops.

(3 marks)

a)

Ben: 200 drops is more than 20 drops

b)

$$\frac{96}{200} = 0.48$$

$$0.48 \times 1000 = 480$$

a) Ben b) 480

9

A gardener finds that the relative frequency of a seed growing into a plant is 0.85.

a. She plants 240 seeds. Estimate how many grow into plants.

b. She wants at least 400 plants. Estimate the smallest number of seeds she should plant.

(4 marks)

a)

$$0.85 \times 240 = 204$$

b)

$$400 \div 0.85 = 470.6...$$

round up so there are at least 400

a) 204 b) 471
